

MSR SAMPLE CACHING STRATEGY WORKSHOP, Jan. 21, 2021.

Dear Colleagues,

We are inviting you to an open virtual science community workshop to consider the strategy for caching samples on Mars as a key element in planning their return to Earth by means of the NASA and ESA Mars Sample Return missions.

In October 2020, NASA and ESA formalized a partnership to bring samples of Mars to Earth. One crucial piece of planning that will have a large impact on the potential number, nature, and diversity of returned samples, and thus on the science that can be performed on the samples, is the caching strategy for the samples collected by the rover Perseverance. The delivery of cached samples to the Sample Retrieval Lander (SRL) is possible via transport by two pathways: 1) retrieval of samples cached on the Mars surface by the Sample Fetch Rover (SFR) and then transport to the Sample Retrieval Lander; and/or 2) delivery of samples retained on Perseverance to the SRL. Thus, there are multiple options for caching. The samples can be cached in one or more depots on the surface of Mars, and the Perseverance rover itself can carry a cache, allowing one or both of the above pathways to be utilized. Which strategies are actually implemented will depend on the nature and perceived value of each sample, the diversity of the samples at a depot, landing site accessibility for SRL, the capabilities of Perseverance and Sample Fetch Rover, lifetime projections for Perseverance and SFR, and the projected risk of rover survivability and trafficability of the terrain encountered. Potential scenarios may include acquiring duplicate samples as well as where, when, and how many depots are established.

We solicit your participation in a four-hour workshop on January 21, 2021 (8am-12pm PST) to consider the strategy for establishing the caches on Mars. Key discussion points will include:

- What are the minimum attributes of a cache that warrants sample return?
- What should be the strategy for duplicate sampling?
- What approach(es) will offer the best balance between minimizing risk and maximizing the scientific value of the samples to be returned?

The workshop will present a review of relevant material, and a forum for community discussion on possible viable scenarios for a sample caching strategy.

More detailed information will be forthcoming. Please let us know of your interest so we can properly scope the meeting by filling out the Indication of Interest form at <https://forms.gle/gf4rxQ1BjFgdVe9BA>

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On behalf of the Caching Strategy Steering Committee (CSSC)